SECTION III. OPERATION

3.3.1 INTRODUCTION

This section provides the information necessary for maintenance personnel to correctly interpret and utilize the controls and indicators associated with data collection package (DCP) assemblies. The operational procedures for the application and removal of DCP input power are also provided.

3.3.2 CONTROLS AND INDICATORS

This paragraph describes the DCP maintenance controls and indicators. The assemblies within the DCP that contain maintenance-related controls and indicators are the status panel of the uninterruptible power supply (UPS), the card rack assembly, and the power control module rack.

3.3.2.1 **UPS Status Panel**. The status panel in UPS 62828-90057 (Class II systems with DCP serial numbers 438 and below) provides an OUTPUT POWER switch and several LED indicators. UPS's 62828-90338-10 and 62828-90338-20 (Class II systems only with serial number 439 and above) provide an on/off switch and several LED indicators. Descriptions of these controls and indicators are provided for their ACU counterpart in Chapter 2, Section III of this manual and are not repeated here. $ $ $

3.3.2.2 **Card Rack Assembly A1A2**. The card rack assembly contains three circuit board assemblies (two distinct types) with controls and indicators: CPU's A and B (slots A1 and A2, respectively) and the memory board (slot A3). Descriptions of the controls and indicators for the CPU boards are provided for their ACU counterparts in Chapter 2, Section III of this manual and are not repeated here. The memory board contains two LED indicators labeled BANK 1 and BANK 2. These indicators are illuminated when their respective memory banks are being accessed by the CPU.

3.3.2.3 **Circuit Breaker Rack A1A3**. The circuit breaker module located in slot A1 controls the application of power to the UPS (Class II DCP) or DCP electronics (Class I) and to the first group of eight sensors. Similarly, the module in slot A10 controls the application of power to the optional second UPS (Class II) and to the second group of eight sensors. The modules in slots A2 through A9 and A11 through A18 control the application of power to the electronics and heaters of the individual sensors. These modules are equipped with relays that allow system software to control power to the sensor electronics. Table 3.3.1 describes the control/indicator functions of a typical power control module as illustrated by figure 3.3.1. Slots A2 through A9 and A11 through A18 contain different models of circuit breaker modules. The types of modules installed in slots A2 through A9 and A11 through A18 depends on the type of sensor being controlled from that slot. Each of the models is defined by a dash number appended to its basic part number. All of the modules have at least one circuit breaker for the corresponding sensor electronics and heaters. Several models also provide a separate, second breaker for the sensor's heater circuits. This heater breaker provides a separate run for sensors with high-current heaters. The circuit breaker module models are identified as follows:

Sensor Type	Dash Number	Heater Breaker	Software Controlled
Ceilometers (CHI)	-10	Yes	Yes (obsolete, use -80)
Temperature/dewpoint (T/D)	-20	No	Yes
Visibility	-30	No	Yes
Wind speed/direction	-40	No	Yes
Present weather	-50	Yes	Yes
Tipping bucket (no electronics)	-60	Heater only	No
Freezing rain	-70	Yes	Yes (obsolete, use -90)
Ceilometer	-80	Yes	Yes
Freezing rain	-90	Yes	Yes
Thunderstorm	-100	Yes	Yes

Table 3.3.1. Power Control Module Controls and Indicators

Control/ Indicator	Type	Description
NOTE Modules that do not utilize both of the circuit breakers described below contain a void in the associated module position.		
POWER	Circuit breaker	When set to on (left) position, ac power is applied to the DCP or sensor associated with specific rack slot assignment. The circuit breaker modules in slots A1 and A10 (if installed) are not software-controllable via the operator interface device (OID). All remaining modules (except the -60, which is heater only) may be controlled from the OID when this breaker is in on position. When set to off (right) position, ac power is removed and the DCP and/or sensor is disabled. Software control cannot enable a module when this breaker is set to off position.
HEATER	Circuit breaker	When set to on (left) position, ac power is applied to the associated sensor's heater circuitry. When set to off (right) position, ac power is removed from sensor circuitry.

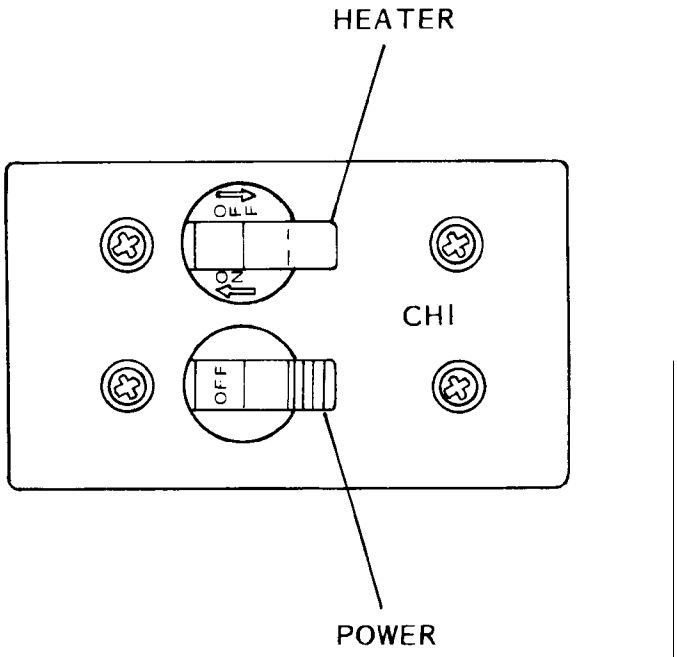

Figure 3.3.1. Power Control Module Controls and Indicators

3.3.2.4 **RF Modems**. RF data modems provide communications between the ACU and DCP cabinets. Only the Johnson Data rf modem (62828-40506-X) has controls and indicators as shown on figure 3.3.2 and described in table 3.3.1A.

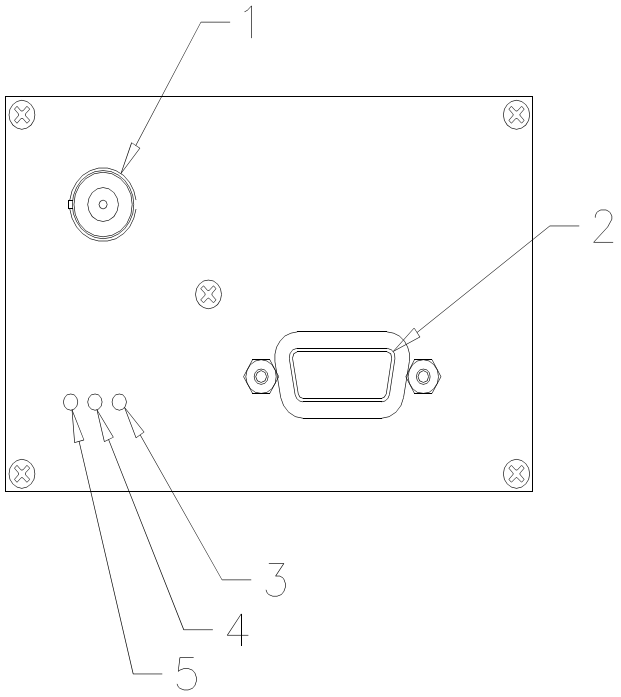

Figure 3.3.2. Johnson Data RF Modem Controls and Indicators

Table 3.3.1A. Johnson Data RF Modem Controls and Indicators

Index	Control/ Indicator	Description
1	SMA Connector	RF output (requires SMAM-to-BNCF adapter)
2	HDB-15 Connector	High density 15 pin female power/communications connector (requires adapter cable 62828-42110-10)
3	RX LED (Yellow)	Illuminates when receiving data
4	TX LED (Red)	Illuminates when transmitting data
5	PWR LED (Green) (Flashing)	Illuminates when power is applied Illuminates when setup mode is active

3.3.3 OPERATIONAL PROCEDURES

Operational procedures associated with the DCP equipment cabinet consist of the application and removal of power. Power up and power down procedures for the DCP equipment cabinet are provided in tables 3.3.2 and 3.3.3, respectively.

3.3.4 USING LAPTOP COMPUTER AS DCP OID

OID display pages are used for testing and other maintenance functions associated with the DCP and sensors. For this reason, the ASOS provides a DCP OID capability. This capability allows a laptop computer (or other VT220/320 terminal) to function as an OID. The laptop computer is connected to DCP SIO port 1-1, which is not used in a Class I DCP but is the UPS port in a Class II DCP. As such, when connecting the laptop computer to a Class II DCP, the technician must disconnect the SIO port connector from the UPS so that the laptop computer can be connected. After connecting and initializing the laptop computer, the system automatically signs the user on to OID #8, as a technician, with the initials DCP. When finished using the DCP OID, the technician signs off of the system from the 1-minute display in the normal manner. The technician must sign off of the DCP OID before removing power from the DCP for any maintenance actions. If the DCP is turned off before the technician signs off, the technician may not be able to initialize the DCP OID after restoring power. Table 3.3.4 provides a procedure to connect the laptop computer to the DCP and initialize the computer as the DCP OID.

Table 3.3.2. DCP Power Up Procedure

Step	Procedure
1	If DCP is a Class II DCP, ensure that UPS POWER switch is set to off (0) position.
2	Ensure that all circuit breaker module switches in Circuit Breaker Rack A1A3 (slots A1 through A18) are set to off (right) position.
3	Set DCP circuit breaker, located in ac junction box, to on position.
4	Set primary Circuit Breaker Module A1A3A1 to ON (left) position. If Class I DCP, power is applied to DCP when this breaker is turned on.
5	If Class II DCP, set UPS POWER switch to on (1) position.
6	To apply power to individual sensors, set corresponding circuit breaker module switches in Circuit Breaker Rack A1A3 (slots A2 through A9 and A11 through A18) to on (left) position.

Table 3.3.3. DCP Power Down Procedure

Step	Procedure
1	In Circuit Breaker Rack A1A3, set sensor circuit breakers in slots A2 through A9 and A11 through A18 to off (right) position.
2	If Class II DCP, set UPS POWER switch to off (0) position.
3	Set primary Circuit Breaker Module A1A3A1 to OFF (right) position.
4	Set DCP circuit breaker, located in ac junction box, to off position.

Table 3.3.4. Connecting Laptop Computer as DCP OID

Step	Procedure
	Tools required: Laptop computer with PROCOMM Plus installed Laptop interface (Y-shaped) cable Laptop null cable DB-9 to DB-25 adapter Large flat-tipped screwdriver Small flat-tipped screwdriver **WARNING** 120 vac is present in cabinet if DCP has not been powered down prior to connecting DCP OID. To avoid death or severe injury, exercise extreme caution when connecting DCP OID.
1	**INITIALIZATION** a. If Class I DCP, locate DB-25 connector for SIO port 1-1 (W017-P22). Proceed to step d. b. If Class II DCP, using large flat-tipped screwdriver, loosen knurled captive screw at top of Circuit Breaker Module Rack A1A3. Lower circuit breaker module rack to gain access to UPS SIO connector. c. Using small flat-tipped screwdriver, disconnect SIO port 1-1 connector (W015-P22) from UPS RS-232 Interface Board A1A8. d. Connect RS-232 (COM1) port of laptop computer to DCP SIO port 1-1 connector (W015/W017-P22) using the following support items: (1) Laptop interface (Y-shaped) cable (2) One DB-9 to DB-25 adapter (3) Laptop null cable e. Raise circuit breaker module rack and secure captive screw. f. Turn on laptop computer and initialize to PROCOMM Plus program. When program initializes, press any key to enter terminal mode (blank) screen. g. Using ALT-S command (setup facility), set up the following TERMINAL OPTIONS: (1) Terminal emulation: VT220 (2) Duplex: FULL (3) Soft flow control (XON/XOFF): OFF (4) Hard flow control (CTS/RTS): OFF (5) Line wrap: OFF (6) Screen scroll: OFF (7) CR translation: CR (8) BS translation: NON-DESTRUCTIVE (9) Break length (milliseconds): 350 (10) Enquiry: OFF (11) EGA/VGA true underline: OFF (12) Terminal width: 80 (13) ANSI 7 or 8 bit commands: 8 BIT h. Return (exit) to terminal mode (blank) screen.

Table 3.3.4. Connecting Laptop Computer as DCP OID - CONT

Step	Procedure
	I. Using ALT-P command (line/port option), set CURRENT SETTINGS as follows: (1) Baud rate: 9600 (2) Parity: NONE (3) Data bits: 8 (4) Stop bits: 1 (5) Port: COM1 j. Return (exit) to terminal mode (blank) screen. k. On laptop computer, set CAPS LOCK to ON and NUM LOCK to OFF. l. Press <CTRL>A (no carriage return). m. Type OID (no carriage return). The system responds with STANDBY while OID initializes. After a short delay, the 1-minute display is displayed on the laptop screen. If display is not correct, set NUM LOCK to ON and press 0 (help) twice to refresh screen. Technician is automatically signed on to OID #8, as a technician, with initials DCP (there is no need for manual sign-on). n. Laptop computer now functions as an OID. Set NUM LOCK to ON to use laptop number keys as OID function keypad in usual manner. Set NUM LOCK to OFF to type alphabetic characters.
2	**SIGNOFF** **NOTE** The technician must sign off of the DCP OID before removing power from the DCP for any maintenance actions. If the technician does not sign off before the DCP is turned off, the technician may not be able to initialize the DCP OID after restoring power. From 1-minute display, sign off in usual manner (select SIGN key, enter DCP as initials, and press return twice). Ensure that NUM LOCK is set to ON when using SIGN key on display and set to OFF when entering initials for signoff.
3	**DISCONNECTING DCP OID** Tools required: Large flat-tipped screwdriver Small flat-tipped screwdriver a. Sign off DCP OID as described above. b. Using ALT-X (exit) command, exit PROCOMM Plus. c. Turn off laptop computer.

Table 3.3.4. Connecting Laptop Computer as DCP OID - CONT

Step	Procedure
	WARNING 120 vac is present in cabinet if DCP has not been powered down prior to connecting DCP OID. To avoid death or severe injury, exercise extreme caution when connecting DCP OID. d. If Class I DCP, disconnect cables and adapter between laptop computer and DCP harness connector W017-P22. Place unused connector P22 in position that it will not be damaged or interfere with other equipment. Procedure is then complete for Class I DCP. For Class II DCP, perform steps e through h. e. If Class II DCP, using large flat-tipped screwdriver, loosen knurled captive screw at top of Circuit Breaker Module Rack A1A3. Lower circuit breaker rack to gain access to UPS SIO connector. f. Disconnect cables and adapter between laptop computer and DCP harness W015-P22. g. Using small flat-tipped screwdriver, install connector W015-P22 to UPS RS-232 Interface Board A1A8. h. Raise circuit breaker module rack and secure captive screw.